ferent from it they applied the name "yew-pine" to it. It should be noted also that the people of the Eastern Shore are not possessed with that restive spirit which characterizes those of other sections and that traditions have remained intact in a higher degree here than elsewhere. Besides the scant means of communication of earlier days, the natural barrier — Chesapeake Bay, and the great distance to other localities for the species — would naturally prevent the people from learning the common name which the tree bears throughout New England and the Middle States.

TAXODIUM DISTICHUM L. The weird Bald Cypress is frequent in swamps in Eastern Maryland and southward. I have observed it along Pocomoke River where it is the prevalent tree and also along Blackwater River at Franklin, Va. Bartram has eulogized it in his Travels (p. 88) and a few lines of his may not be amiss: "its majestic stature is surprising; and on approaching it, we are struck with a kind of awe, at beholding the stateliness of the trunk, lifting its cumbrous top toward the skies; and casting a wide shade upon the ground, as a dark intervening cloud, which, for a time excludes the rays of the sun." I have seen them in all their magnificence in Florida.

WASHINGTON, D. C.

IS VIOLA ARENARIA DC. INDIGENOUS TO NORTH AMERICA?

EZRA BRAINERD.

(Plate 104.)

EUROPEAN students of *Viola* have recently reduced *V. arenaria* DC. (1805) to varietal rank, as differing from the older *V. rupestris* Schmidt (1791) only in being "densely short-hairy or downy."[1] This requires a corresponding change in the name of the American species, that has been generally passing as *V. arenaria* since the publication of the Illustrated Flora in 1897. But before doing this, it seems a fitting time to review critically the claim that the plants of

[1] Reichlich kurzhaarig oder pflaumig,— W. Becker, Flora Bayerns.

the two hemispheres are of the same species. Through the kindness of Dr. Millspaugh, of the Field Museum, Chicago, I have had the loan for several months of 45 excellent specimens of the European *V. arenaria*, and of 577 additional specimens of allied European species of the *canina* group. The opportunity thus afforded for a careful comparison has convinced me beyond a doubt that our so-called *V. arenaria* is specifically different from the Old World *V. arenaria* DC. Without going into a detailed discussion of the points of difference, I would present them concisely in the following table: — (See plate 104.)

V. RUPESTRIS var. ARENARIA (DC.) Beck.	AMERICAN ALLY
LEAVES: roundish, not much longer than wide, rarely over 2 cm. long;	broadly ovate, bluntly pointed, usually 2–5 cm. long.
STIPULES: ovate to oblong, with acute close-set deltoid teeth;	linear to lanceolate, with scattered setulose teeth mostly near the base.
FLOWERS: much overtopping the leaves;	slightly overtopping the leaves.
BRACTS of peduncles usually on a level with the flower;	usually much below the flowers.
PETALS: broadly obovate, 4–6 mm. wide;	narrowly obovate, commonly 3–4 mm. wide.
SPUR: 3–4 mm. long, straight, blunt;	5–7 mm. long, often curved upward or hooked.
CAPSULE: pubescent;	glabrous.

It should be noted that occasional specimens from the Old World labeled "*V. arenaria*" are not typical, but rather hybrids of this with allied species of the same group. Six such hybrids are listed in W. Becker's VIOLAE EUROPAEAE; some of them closely simulate the American plant.

The task, then, is before us to determine what name, if not *V. arenaria* nor *V. rupestris*, rightfully belongs to our native species. We note, first, that though the plant is not infrequent along the whole northern border of the eastern United States and adjacent Canada, its occurrence in this tract was not recognized until within the last twenty-five years. Dr. Gray, indeed, had once before him a specimen collected by Dr. Engelmann in loose sands on the shore of Lake Superior; but he considered it "a summer form" of *V. canina* var.

Muhlenbergii, that "imitates the European *V. arenaria*." In the Gray Manual the plant is first recognized in 1890, by Dr. Watson, under the name *V. canina* var. *puberula*, "sandy or stony shores and islands of Lakes Huron and Superior." Six years later, in the Synoptical Flora, the range of this variety is extended across the continent, from Maine to Washington and Oregon.

This wide stretch of range is not uncommon among our northern plants, and a thorough study of the abundant material in five of our largest herbaria,[1] affords emphatic confirmation of Dr. Robinson's statement in the Synoptical Flora. The specimens vary considerably in size, in the amount of pubescence, and in the presence of flowers with hooked spurs; but not more so in the western plants than in the eastern.

Now, the plant of the Pacific coast is evidently what Sir J. E. Smith published in 1817 as *Viola adunca*.[2] But Dr. Gray conceived Smith's species to be "nearly glabrous," and subsequent authors have simply echoed his statement[3]; but the author of the species says the leaves are "downy," and emphasizes this character as chiefly distinguishing his species from *V. canina*. I quote Smith's description in full, that the reader may see for himself how well it applies to the eastern plant under discussion: —

"63. VIOLA ADUNCA. Hooked Violet.— Stems simple, ascending. Leaves ovate, somewhat heart-shaped, obtuse, crenate, downy, dotted. Stipulas loosely fringed. Flower-stalks longer than the leaves. Nectary hooked.— Brought by Mr. Menzies from the west coast of North America. This species has the size and habit of *V. canina;* and their *stipulas*, *flower-stalks*, and *bracteas* are similar. The *calyx-leaves* too are extended, in like manner, at the base. The whole of the herbage is minutely speckled, as in our last species,[4] as well as in *canina*. But the plant is more or less downy, and clearly distinguished by the strongly recurved form of the *spur*, which if straight would be as long as the *lip*. The two lateral petals are downy at the base. Perhaps this species is more akin to *canina* than to any other, and ought to stand near it; at least if the *rubella*[5] and *maculata* have no elongation [auricles] at the base of their *calyx*."

[1] I am under especial obligation to Prof. Trelease, recent Director of the Missouri Botanical Garden, for the loan of 126 sheets of this species.

[2] Rees' Encyclopedia vol 38; no. 63 under article on *Viola*.

[3] "Herbage glabrous or nearly so," Piper in Flora of Washington; "glabrous or nearly so," Nelson in New Manual of Rocky Mt. Botany; in key, unqualifiedly "Leaves glabrous."

[4] No. 62. *V. maculata* Cavan., from the Falkland Islands.

[5] No. 61. *V. rubella* Cavan., native of Chili, South America.

'Downy,' though here used three times, is infrequent as a botanical term; but it is good Saxon English for a soft pubescence more pronounced than puberulence; conversely, Webster defines 'puberulent' as "very minutely downy." In the *canina* group there is but one species "from the west coast of North America," that is either downy or puberulent; and if so, we can hardly do otherwise than regard it as the *V. adunca* of Smith, and the *V. canina* var. *puberula* of the Synoptical Flora.

At the same time it should be said that forms of *V. adunca* occur on both sides of the continent that are "glabrous or nearly so." This fact, however, does not embarrass the situation; for there is not a single pubescent species of *Viola* in the western United States that does not furnish forms nearly or quite glabrous. We may question the need of giving a special name to every glabrous form of a pubescent violet, or to every white-flowered form of a purple violet; but in the case of *V. adunca* it will save confusion thus to recognize the occasional loss of this prominent character of the type,— marking a distinction just the reverse of that now made between *V. rupestris* Schmidt and its var. *arenaria* (DC.) Beck.[1] I would therefore propose: —

VIOLA ADUNCA var. **glabra**, var. nov. Planta foliis, stipulis, caulibusque glabris; aliter typo similis, ad quem transit,— Leaves, stipules, and stems glabrous; otherwise as in the type, into which it passes.— Eastern specimens seen are: QUEBEC: — gravelly beach, Carlton, Bonaventure Co., *Collins & Fernald* 111, July 19, 1905. PRINCE EDWARD ISLAND: — *L. W. Watson*, 1904 (live plants, still in cultivation at Middlebury, Vt.). NEW BRUNSWICK:— sand plain, Miscou Island, *W. F. Ganong*, August 15, 1905; Grand Menan Island, *J. Vroom*, May 9, 1880. ONTARIO:— Drommond's Island, Niagara, *Macoun*, May 13, 1901. MICHIGAN:— Isle Royale, *W. S. Cooper*, Aug. 20, 1909. N. DAKOTA:— Peninsula of Lake Ibsen, Benson Co., *Dr. J. Lunell*, May 10, 1907.

Some further comments may be permitted, in order to clear up other misapprehensions regarding *V. adunca* and its allies.

The hooked spur that suggested the specific name, though doubtless seen in all the specimens before the author of the species, is far from being a constant character, and occurs occasionally in such allied

[1] The following observation of Wilhelm Becker applies equally well to the allied American species, if we omit the word "only":— "*V. rupestris* varies only as respects pubescence, which is ± evident or quite lacking. The completely glabrous form occurs, sometimes, exceptionally; but sometimes it is the exclusive form of a whole region. * * The two are connected by transitional forms." Translated from VIOLAE EUROPAEAE, p. 48.

species as *V. rostrata* and *V. conspersa*. Sir William J. Hooker observes [1] that "the greater number [of spurs in *V. adunca*] are straight, thick and very obtuse," though they are generally uncinate "in the state of bud." The spurs of these species are unusually long, and apparently are doubled up in aestivation, and when the flower expands often do not quite straighten out. The spur not infrequently displays other aberrant forms,— tapering to a more or less acute point, or bearing one or more small protuberances on the upper side. Several pseudo-species have been founded on these trivial malformations: *V. oxyceras*, *V. odontophora*, *V. unguiculata*, *V. drepanophora*, *V. mamillata*, *V. uncinulata*. Dr. Watson, with more reason, would distinguish all the forms with straight blunt spurs as var. *longipes* (Nutt. pro sp.). But both kinds of spur, straight and hooked, are at times to be seen on the same plant! Nuttall's *V. longipes* is by others taken to designate the glabrous forms; but his description reads "glabrous or slightly pubescent"; and one of the two plants collected and labeled by himself as his type (or at least marked with an asterisk, his way of writing 'n. sp.') shows marked puberulence. Should not the name be allowed to pass into the 'limbo of synonymy'?

The dotted, or minutely speckled, herbage ascribed by Sir J. E. Smith to *V. adunca* is not a proper character, but rather a condition not found in the living plant, but in specimens poorly dried, or later exposed to heat and moisture. It is the effect of fermentation induced by enzymes.[2] It may be observed on old specimens of many species of *Viola* that are but remotely related to each other. Its presence, however, has suggested several specific names, such as *V. punctata* Schwein., *V. conspersa* Reichenb., *V. maculata* Cavan. Hooker, confirming Smith's account of dotted leaves in *V. adunca*, says that all his own specimens, and these from very remote localities, are "so thickly covered with distinct brown dots as to give a dusky hue to the foliage, and to bring the species near to some of the South American kinds, which present that appearance in a remarkable degree." Dr. Gray, among the characters separating *V. striata* and *V. canina* from his *V. Howellii*, says the leaves of the former are "apt to be brown-dotted in age," those of the latter are "dotless." [3] But

[1] Flora Bor.-Am. i. 79. 1830.

[2] I am indebted to Prof. Burns of the University of Vermont for a microscopic investigation of this phenomenon.

[3] Synop. Fl. N. Am. I. pt. 1. 204 & 205.

Dr. Gray had before him only fresh and well-dried specimens from Howell and Suksdorf. As a matter of fact, good specimens of *V. Howellii,* markedly punctate with minute dots, are to be seen in the herbaria both at St. Louis and at New York; [1] in the latter herbarium is also an older specimen,[2] marked in pencil by Dr. Gray as "large *V. canina.*"

The acaulescent appearance that *V. adunca* sometimes assumes at vernal flowering has been a cause of further confusion. The American caulescent species that bear violet-colored flowers all belong to the group 'ROSULANTES,' marked by bearing in spring at the crown of the rootstock a cluster of leaves. From the axils of these the stems later appear, and often petaliferous flowers on long scape-like peduncles, especially if the growth of the stems is retarded. These undeveloped forms are easily mistaken for stemless species. Even Dr. Gray, thus misled, has in the Synoptical Flora placed *V. Langsdorfii* (a stemmed violet of the Northern Pacific coast, allied to *V. adunca* and the Eurasian *V. mirabilis*) in the section of species "strictly acaulescent." Dr. Greene has published as a species (*V. filipes*) a seemingly acaulescent form of *V. adunca.* (Pitt. iv. 289.) On the other hand, Howell and others have distributed *V. nephrophylla,* a truly stemless species as *V. Howellii,* supposing it the form with undeveloped stems.—In Garcke's German Flora, at the end of his treatment of the stemless violets, there is a sign-board, warning every one not to locate there forms of *V. mirabilis* that are stemless at first flowering.[3] We may need to have a like caution inserted in our American manuals.

MIDDLEBURY, VERMONT.

EXPLANATION OF PLATE 104.

1. *Viola adunca* J. E. Smith, (*E. Brainerd*, Bristol, Vt., May 26, 1912), × $\frac{8}{9}$. A. stipule × 2; B. immature capsule × 3.
2. *Viola rupestris* Schmidt var. *arenaria* (DC.) Beck.; after Schlechtendal revised by Hallier, fig. 1273. × $\frac{8}{9}$. C. stipule × 2; D. capsule × 2; both after Reichenbach, Pl. crit. lxxii.

[1] Pt. Reyes, Marin Co., Cal., July, 1903, *A. D. E. Elmer;* labeled "*V. cuneata.*"
[2] Swamps at Noyo, Mendocino Co., Cal. Bolander, coll. 1867.
[3] Man hüte sich, die zuerst blühenden, stengellosen Pflanzen von *V. mirabilis* hieher zu rechnen."